



U.S. DEPARTMENT OF  
**ENERGY**

# **Presentation to the Citizen's Advisory Board on May 24, 2011**

## **Heavy Water**

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**EM** *Environmental Management*  
safety ♦ performance ♦ cleanup ♦ closure

# Heavy Water Background

- **Light water properties**
  - Composed of 2 atoms of hydrogen & 1 atom of oxygen ( $H_2O$ )
- **Heavy water properties**
  - Looks, feels & smells like light water
  - Composed of 2 atoms of deuterium instead of hydrogen ( $D_2O$ )
    - Heavy water is not considered radioactive
  - Found naturally in small quantities
    - 1 pound of heavy water can be found in every 3 tons of light water
  - Neutrons slow down in heavy water, which promotes fission
- **Majority of U.S. heavy water supply was made at SRS**
  - Needed for operation of 5 SRS production reactors
    - Used as primary coolant to remove fission heat from fuel elements & to assist in fission
    - Tritium in heavy water was a by-product from reactor operations
  - Today, no current need or production capability exist at SRS



# Interim Storage of Heavy Water

Storage Location	Drums	Tanks	Gallons	Curies
K Area	1914	3	~162,000	1,405,000
L Area	4859	3	~331,000	1,500,000
C Area	0	2	~43,000	640,000



# Disposition Path Options

- **Beneficial reuse option**
  - CANDU reactors
- **Treatment and Disposal option**
  - Ship to offsite treatment & disposal vendor
  - Ultimate disposal location to be determined



# Summary

- **Over 500,000 gallons of heavy water is stored at SRS without a DOE programmatic purpose**
- **Removal of heavy water will result in significant curie reduction**
- **Disposition paths are under evaluation but no decision has been made at this time**

